DOCUMENT RESUME

ED 173 447 TM 009 627

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TITLE Student Generated Items as an Instructional Tool.
PUB DATE [Apr 79]
NOTE 10p.; Paper presented at the Annual Meeting of the National Council on Measurement in Education (San Francisco, California, April 9-11, 1979); Best copy available

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Achievement Tests; College Instruction; Content Analysis; *Course Objectives; Higher Education; Item Analysis; *Learning Activities; Measurement; *Statistics; *Student Participation; Teamwork; *Test Construction; *Test Interpretation; Test Items

ABSTRACT

Undergraduate students in a large tests and measurements class were assigned a series of projects directly related to course content: (1) divide the textbook and instructional content into topical sub-sections; (2) identify learning outcomes for each sub-section; (3) list course objectives--working in groups of 3-6 students; (4) revise objectives--among entire class; (5) divide the task of item writing for the final list of objectives; (6) critique items and construct a quiz; (7) administer quiz and conduct item analyses; and (8) conduct an item-by-item critique--among the entire class--to determine which items need revision or deletion. This instructional strategy increased the students' involvement and cooperation, but required a considerable amount of class time. (Four behavioral objectives constructed by the students are presented, as well as a sample item card, the 27-item test, and a computer printout of quiz results.) (GDC)

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STUDENT GENERATED ITEMS AS AN INSTRUCTIONAL TOOL

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The instructional procedures described herein are in response to the difficulties encountered affording adequate practice/feedback on objective writing and item construction through individualized test construction projects for "large" sections of an undergraduate tests and measurements course.

It was decided to replace the single individualized construction project with a series of smaller projects directly related to course content. The procedures are as follows:

1. Divide the textual and instructional materials for the unit currently being covered into topical sub-sections.
2. Assign three to six students the task of independently identifying learning outcomes for each of sub-sections.
3. Allow each small group to negotiate a list of agreed upon objectives.
4. Present objectives for all sub-sections to the total class. Allow questions of clarification to be directed to the group by other students and instructor. Revise objectives as indicated.
5. Allow each group to divide the task of item writing for the final list of objectives.
6. Critique items and build quiz using both selected student and supplementary items from item file as needed.
7. Administer quiz and run item analysis.
8. Return quiz with copy of item analysis and conduct item by item class critique to determine items in need of revision or deletion.
9. Start process again for next unit.

Presented at the annual meeting of National Council on Measurement in Education, San Francisco, CA, 1979.

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Suggested advantages of present strategy over individualized test construction project:

--distributed practice/feedback on objective/item writing

--greater attention and focus to tests and measurement course content

--more communication/cooperation among students on course content

--objective/item writing over a broader range of learning outcomes

--more even distribution of instructor's effort involved in giving feedback

--student's more ego involved in their product

--others?

Suggested disadvantages:

--initially more ambiguous task for student

--consumes a considerable amount of class time

--somewhat more threatening

--greater gap in transfer to test construction in student's substantive area

--others?

Example of student generated objectives for Chapter 3 of Chase, C.I. Measurement for Educational Evaluation, 2 Ed. Reading, MA: Addison-Wesley, 1978.

1. Given a set of scores, recognize a properly constructed frequency distribution.
2. Identify the advantages and limitations of a grouped frequency distribution.
3. Given a frequency distribution, identify:

a. mean	f. skewness
b. median	g. z scores
c. mode	h. T scores
d. standard deviation	i. percentile ranks
e. range	j. stanines

4. Identify appropriate uses and limitations of a. - j. on preceding page.

Sample item (actually prepared on 5" x 8" card):

_____ "Degrading the data" is a limitation of:

1. score frequency distribution
2. skewed distribution
3. normal distribution
4. grouped data frequency distribution

	(ch.)	(Obj.)	(Key)
(Objective stated on back of card)	3	2	4

Student Name

EDU-451
Tests and Measurement

Spring 1979
K. Crehan

Quiz 2. Name _____ Score _____

Select the best option to complete each stem. Answer all.

1, The score point on a distribution that cuts off half of the individuals below it and half above it is called:

1. Median
2. Mean
3. Ratio
4. Normal Curve

2. The arithmetic average of a set of scores is called the

1. median
2. mode
3. midpoint
4. mean

3. The arrangement of scores from high to low, with the number of students who achieved each score is:

1. mean
2. standard deviation
3. frequency distribution

4 Which of the following may have more than one value in the same distribution?

1. mean
2. median
3. mode
4. range

5. The mode of the following scores is ___.
4,5,3,8,6,5,4,6,4,7

1. 4
2. 5
3. 6
4. none of these

6. "Degrading the data" is a limitation of:
1. score frequency distribution
2. skewed distribution
3. normal distribution
4. grouped data frequency distribution

7. Which of the below is false regarding stanines:

1. The simple, one digit scores are easy to record on cumulative records, saving time and space.
2. Stanines can't be averaged.
3. The nine point scale is easily understood.
4. A childs performance can be compared from one test to another.

Items 8 to 11 are based on the following data.

GIVEN THE FOLLOWING DISTRIBUTION:

X	FREQUENCY
15	8
14	10
13	7
12	0
11	3
10	2
9	2
8	2
7	0
6	4
5	3
4	2
3	3
2	2
1	2

____ 8. THE MEDIAN IS

1. 13
2. 12
3. 11
4. 10
5. 9

____ 9. THE MEAN IS

1. 13
2. 12
3. 11
4. 10
5. 9

____ 10. THE DISTRIBUTION CAN BEST BE DESCRIBED AS

1. NEGATIVELY SKEWED
2. POSITIVELY SKEWED
3. SYMMETRIC

____ 11. THE INDICATOR OF TYPICAL PERFORMANCE THAT BEST DEPICTS THE AVERAGE IS

1. THE MEAN
2. THE MEDIAN
3. THE MODE

____ 12. Choose the following statement which doesnot apply as a characteristic of range.

1. It is useful as a quick indicator of the dispersion of scores.
2. It is found by subtracting the lowest score from the highest score and adding one.
3. It is a useful indicator of how much individual scores deviate from the mean.
4. Its value depends on a limited number of scores within the group.

____ 13. Choose the following option which correctly states the correct procedure for computing the standard deviation.

1. Obtain the deviation of all scores from the mean, square each, add the squares, divide this sum by the total number of scores, obtain the square root of this figure.
2. Total all scores, square this total, divide this figure by the total number of scores, obtain the square root of this figure.
3. Obtain the individual square roots of all the scores, total these, divide this figure by the total number of scores, square this figure.

____ 14. When a distribution is positively skewed, the mean will be located

1. to the left of the median.
2. to the right of the median.
3. at the same point as the median.

____ 15. Stanines are often criticized because they

1. are difficult to compute.
2. are difficult to interpret.
3. eliminate comparisons with other achievement test data.
4. often group many scores into one band.

____ 16. An identification of a score by comparison with other scores at or below the same level is the

1. cumulative frequency distribution.
2. frequency distribution.
3. percentile rank.
4. stanine.

____ 17. A 'T' score distribution has a mean of 50 and a standard deviation of 10. Given that an individual has a z score of .5 what would his T score be?

$T = \bar{X} + (z)(S)$

1. 35
2. 45
3. 55
4. 65

Items 18 and 19 are based on the following data:

Presented below are the means and standard deviations on four tests and the results for an indivisual, Mickey, from the group on which the summary statistics were determined.

Test	$\bar{X}$	S_x	Mickey's score
Algebra	37	4	47
Science	69	3	70
English	53	9	59
History	49	12	73

____ 18. In comparison to the total group on which test did Mickey do the best?

1. Algebra
2. Science
3. English
4. History

____ 19. In comparison to the total group on which test did Mickey do the poorest?

1. Algebra
2. Science
3. English
4. History

Items 20 to 27 are based on the following data:

Ms Drivel administered a 25 item math test to her class on Monday and a 10 item spelling test on Tuesday. Given are the scores from both tests for each student.

STUDENT	MATH	SPELLING
Adolf	20	9
Bertha	21	8
Clyde	18	7
Daisy	16	6
Elmer	19	7
Fanny	13	5
Gretel	24	9
Hansel	17	7
Irma	15	5
Jarvis	17	7

These formulas are provided to help answer the following eight questions:

$$\text{Mean} = \bar{X} = \frac{\Sigma \text{scores}}{N}$$

$$\text{Standard Deviation} = s = \sqrt{\frac{\Sigma(\text{each score} - \bar{X})^2}{N}}$$

$$z \text{ score} = z = \frac{\text{score} - \bar{X}}{s} \qquad T \text{ score} = 50 + 10(z)$$

____ 20. The standard deviation for the spelling test is 1.34. Compute the standard deviation for the math test and select the proper answer.

1. 1.00
2. 2.00
3. 3.00
4. 4.00

Match the proper standard score from the math test for each student listed on the left.

____ 21. Clyde

____ 22. Elmer

____ 23. Fanny

____ 24. Gretel

1. z of 50
2. T of 70
3. z of .33
4. T of 33
5. z of 0

____ 25. Little Clyde received the fifth highest raw score of his class on his math test and the third highest raw score of his class on his spelling test. He wants to show his mom that his status in his class for spelling is better than his status for math. What scores should Clyde show his mother from these two test?

1. His raw scores
2. His percentile scores
3. His T scores
4. None of the above

____ 26. Ms Drivel has decided to rank order her class based on the combined results of both the math and the spelling tests. The combined raw scores of little Adolf and little Bertha are 29 for each child. How should she rank order Adolf and Bertha?

1. Both are the same.
2. Adolf is higher than Bertha.
3. Bertha is higher than Adolf.
4. Insufficient data is given to determine rank order.

____ 27. Little Clyde has a percentile rank of 55 for his math test. Find his <u>percentile rank</u> for his <u>spelling test</u>.

1. 55
2. 50
3. 45
4. 40

EDU 431 SPG 79 QUIZ 2
NO. VARIABLES = 27
MINIMUM SCORE = 0 MAXIMUM SCORE = 0
NO. CRITERION VARIABLES = 0

NO. SUBJECTS = 17.
MEAN OF RAW SCORES = 20.47
STANDARD DEVIATION OF RAW SCORES = 4.39

ITEM	ANS. KEY	ITEM MEAN	ITEM S.D.	ITEM CORR.	REL. INDX	PERCENT IN EACH ALTERNATIVE 0	1	2	3	4	5	6	7	8	9
1	1	1.00	0.00	99.99	0.00	0.	100.	0.	0.	0.	0.	0.	0.	0.	0.
2	4	.88	.32	.39	.15	0.	0.	12.	0.	88.	0.	0.	0.	0.	0.
3	3	.88	.32	.22	.09	0.	6.	6.	88.	0.	0.	0.	0.	0.	0.
4	3	.59	.49	.47	.27	0.	6.	6.	59.	29.	0.	0.	0.	0.	0.
5	1	.71	.46	.21	.14	0.	71.	12.	0.	18.	0.	0.	0.	0.	0.
6	4	.88	.32	.49	.17	0.	0.	12.	0.	88.	0.	0.	0.	0.	0.
7	2	.88	.32	-.03	-.01	0.	0.	88.	0.	12.	0.	0.	0.	0.	0.
8	2	.65	.48	.57	.31	0.	12.	65.	18.	0.	6.	0.	0.	0.	0.
9	4	.71	.46	.73	.35	0.	6.	6.	12.	71.	6.	0.	0.	0.	0.
10	1	.65	.48	.41	.24	0.	65.	35.	0.	0.	0.	0.	0.	0.	0.
11	2	.59	.49	.44	.26	0.	35.	59.	6.	0.	0.	0.	0.	0.	0.
12	3	.76	.42	.42	.21	0.	12.	6.	76.	6.	0.	0.	0.	0.	0.
13	1	.88	.32	.39	.15	6.	88.	0.	6.	0.	0.	0.	0.	0.	0.
14	2	.76	.42	-.10	-.00	0.	18.	76.	6.	0.	0.	0.	0.	0.	0.
15	4	1.00	0.00	99.99	0.00	0.	0.	0.	0.	100.	0.	0.	0.	0.	0.
16	3	.76	.42	.53	.25	0.	18.	0.	76.	6.	0.	0.	0.	0.	0.
17	3	.88	.32	.53	.19	0.	0.	6.	88.	6.	0.	0.	0.	0.	0.
18	1	.71	.46	.14	.11	0.	71.	0.	0.	29.	0.	0.	0.	0.	0.
19	2	.88	.32	.26	.11	0.	0.	88.	12.	0.	0.	0.	0.	0.	0.
20	3	.88	.32	.53	.19	0.	12.	0.	88.	0.	0.	0.	0.	0.	0.
21	5	.82	.38	.63	.26	0.	6.	6.	0.	6.	82.	0.	0.	0.	0.
22	3	.94	.24	.32	.09	0.	0.	0.	94.	0.	6.	0.	0.	0.	0.
23	4	.82	.38	.67	.27	0.	12.	0.	0.	82.	0.	0.	0.	0.	0.
24	3	.94	.24	.32	.09	0.	0.	94.	0.	6.	0.	0.	0.	0.	0.
25	0	0.00	0.00	99.99	0.00	0.	12.	29.	24.	35.	0.	0.	0.	0.	0.
26	2	.35	.48	.45	.20	0.	24.	35.	12.	29.	0.	0.	0.	0.	0.
27	2	.65	.48	.41	.24	0.	12.	65.	6.	12.	6.	0.	0.	0.	0.

ALPHA RELIABILITY = .83

COEFFICIENT OF SKEWNESS = -.59985 COEFFICIENT OF KURTOSIS = 1.97104

SKEWNESS CRITICAL RATIO =-1.0097 KURTOSIS CRITICAL RATIO = -.8660
WHEN A CORRELATION COEFFICIENT IS 99.99, THE DIVISOR IN THE CORRELATION FORMUL